
Space Weather Forecast

Issued on Wednesday, 12 October 2022 at 13:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only common class flares observed. These are mainly from the moderately sized region in the northwest, including one long lasting flare early on the 12th. This region has shown some simplification as it approaches the western limb, with visible spots appearing to shrink in size, and perhaps a simpler magnetic structure developing. The other region to the north of this one, also simplified to a unipolar spot. Common class-flaring was also observed from a further region, also in the northwest quadrant, but closer to the centre disc. This remains a smaller and simpler region. No Earth directed coronal mass ejections (CMEs) were observed, however the Earth-facing Sun is littered with a number of "filaments". These are lines of material held together due to the Sun's magnetic field, and can be a source of CME's, without significant flares. These will be monitored for any potential lift (or "eruption") of these features.

Solar Wind / Geomagnetic Activity: The solar wind declined from slightly elevated speeds of around 450 km/s to background levels of just below 400 km/s. The total magnetic field was weak, with the north-south field often pointed in the southward direction (negative) but too weak to result in any notable geomagnetic activity. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: Despite Moderate flaring from the large sunspot on previous days, the count rate of energetic particles (high energy protons) remained at background levels. Consequently no solar radiation storms occurred.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with the main risk of Moderate flares from the moderately sized region in the northwest.

Solar Wind / Geomagnetic Activity: There is a CME that while likely to miss Earth on day 3 (14th), has a small chance of giving a peripheral influence as it passes. Otherwise Earth will likely see background winds persisting through much of the period, before the arrival of the fast winds from a coronal hole late on day 3 or more likely day 4 (14th or 15th). Geomagnetic activity will be mostly Quiet with a chance of isolated Unsettled intervals, perhaps increasing to Active with any fast wind arrival later in the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles is except to remain at background, but could rise in response to any large flares, mainly from the sunspot in the northwest. This gives a very slight chance of exceeding the S1/Minor Radiation Storm threshold.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	40	40	40	10
Very Active	R3 to R5 X	No	2	2	2	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)